

Claims

- [c1] What is claimed is:
- 1.A motor silencer comprising:
a molded composition having a first surface and a second surface;
the first surface having a contour that substantially matches a contour of a cover of the motor; and
the second surface having a contour that conforms about internal components of the motor.
 - [c2] 2.The motor silencer of claim 1 wherein the motor is an outboard motor.
 - [c3] 3.The motor silencer of claim 2 wherein the cover of the outboard motor is at least one of an engine cover, a starboard side cover, and a port side cover.
 - [c4] 4.The motor silencer of claim 2 wherein the molded composition further comprises an edge constructed to snugly engage a lower unit of the outboard motor.
 - [c5] 5.The motor silencer of claim 1 wherein the molded composition lowers the sound emission of an outboard motor by at least 3 decibels at engine idle.

- [c6] 6.The motor silencer of claim 1 wherein the molded silencer is a foam material.
- [c7] 7.The motor silencer of claim 1 wherein the molded composition is incorporated into an outboard motor that emits approximately 75 decibels while operated at approximately 2300 RPM.
- [c8] 8.The motor silencer of claim 1 wherein the molded composition is incorporated into an outboard motor that emits approximately 83 decibels while operated at approximately 4000 RPM.
- [c9] 9.The motor silencer of claim 1 wherein the molded composition is incorporated into an outboard motor that emits approximately 89 decibels while operated at approximately 5400 RPM.
- [c10] 10.The motor silencer of claim 1 wherein the molded composition is incorporated into an outboard motor that emits approximately 92 decibels while operated at approximately 5800 RPM.
- [c11] 11.The motor silencer of claim 1 further comprising an engine cover of an outboard motor, the engine cover enclosing an engine on a portion of at least three sides and defining a volume between the engine and the engine cover wherein a majority of the volume between the in-

ternal components and the cover is filled with the molded composition.

- [c12] 12.The motor silencer of claim 1 wherein the molded composition has a variable thickness that varies about a dimension of the molded composition, wherein the variation is based on the internal components of the motor and a shape of the cover.
- [c13] 13.The motor silencer of claim 1 wherein the molded composition is comprised of a material having a plurality of interstitial cavities.
- [c14] 14.The motor silencer of claim 1 wherein the molded composition is constructed of one of a cast mold and an injection mold.
- [c15] 15.The motor silencer of claim 1 wherein the molded composition maintains a gap between the second surface and the internal components of the motor.
- [c16] 16.The motor silencer of claim 1 wherein the molded composition has a density range from two to twenty-two pounds per cubic foot.
- [c17] 17.The motor silencer of claim 1 wherein the molded composition is at least partially resistant to fluid penetration.

- [c18] 18. An outboard motor comprising:
a midsection having at least one midsection cover;
the midsection cover having a first contour defining a first volume between the midsection and the midsection cover;
a first silencer filling a majority of the first volume;
an engine disposed adjacent the midsection;
an engine cover having a second contour and defining a second volume; and
a second silencer disposed in the second volume between the engine and the engine cover and molded to substantially match the contour of the cover.
- [c19] 19. The outboard motor of claim 18 wherein the first silencer is comprised of a material having a density that is greater than a density of a material of the second silencer.
- [c20] 20. The outboard motor of claim 19 wherein the density of the material of the first silencer is at least fourteen pounds per cubic foot.
- [c21] 21. The outboard motor of claim 19 wherein the density of the material of the second silencer is at least two pounds per cubic foot.
- [c22] 22. The outboard motor of claim 18 wherein the second

silencer further comprises a recess having a contour that generally matches a contour of the engine.

[c23] 23.The outboard motor of claim 18 wherein the first and the second silencer are waterproof.

[c24] 24.The outboard motor of claim 23 wherein the first silencer is more waterproof than the second silencer.

[c25] 25.The outboard motor of claim 22 wherein a variable distance is maintained between a surface of the recess and a surface of the engine.

[c26] 26.The outboard motor of claim 18 further comprising a second midsection cover having a contour defining a third volume between the second midsection cover and the midsection and having a third silencer disposed therein.

[c27] 27.The outboard motor of claim 26 wherein the third silencer has a contour that substantially matches a contour of the third volume.

[c28] 28.The outboard motor of claim 27 wherein the third silencer is comprised of a material having a density that is greater than a density of the second silencer.

[c29] 29.The outboard motor of claim 18 incorporated into a watercraft.

- [c30] 30.The outboard motor of claim 18 wherein the outboard motor emits approximately 83 decibels while operated at approximately 4600 RPM.
- [c31] 31.The outboard motor of claim 18 wherein the outboard motor emits approximately 89 decibels while operated at approximately 5400 RPM.
- [c32] 32.The outboard motor of claim 18 wherein the outboard motor emits approximately 55 decibels while operated at approximately 500 RPM.
- [c33] 33.The outboard motor of claim 18 wherein the outboard motor emits approximately 79 decibels while operated at approximately 3450 RPM.
- [c34] 34.A method of silencing an outboard motor comprising:
providing a housing having a cover and at least one lower unit cover each being engagable on an outboard motor; and
providing a silencer molded to substantially match the shape of the cover and constructed to absorb sound emitted from the motor.
- [c35] 35.The method of claim 34 further comprising providing a silencer molded to substantially match a shape of a portion of an engine.

- [c36] 36.The method of claim 35 further comprising positioning the silencer about the portion of the engine and positioning the cover about the silencer.
- [c37] 37.The method of claim 34 wherein providing the silencer is one of injection molded and cast molded.
- [c38] 38.The method of claim 34 further comprising providing another silencer molded to substantially match a volume between the lower unit cover and a lower unit.
- [c39] 39.The method of claim 38 further comprising providing another silencer molded to substantially match another volume between another lower unit cover and the lower unit.
- [c40] 40.The method of claim 39 further comprising positioning each of the silencers about the outboard motor and substantially enclosing the motor therein.
- [c41] 41.An outboard motor comprising:
an engine attached to a midsection;
a cover disposed about the engine and enclosing a volume therebetween; and
a vibro-acoustic treatment disposed within the volume and molded to substantially match a shape of the volume.

- [c42] 42.The outboard motor of claim 41 further comprising a first lower unit cover constructed to enclose a portion of the midsection and define a volume therebetween.
- [c43] 43.The outboard motor of claim 42 further comprising another vibro-acoustic treatment molded to substantially match the volume between the first lower unit cover and the midsection.
- [c44] 44.The outboard motor of claim 43 further comprising a second lower unit cover constructed to enclose another portion of the midsection and defining a volume therebetween and a third vibro-acoustic treatment molded to substantially match the volume between the second lower unit and the midsection.
- [c45] 45.The outboard motor of claim 44 wherein the midsection is circumferentially enclosed by the vibro-acoustic treatments positioned thereabout.
- [c46] 46.The outboard motor of claim 41 wherein the vibro-acoustic treatment is integrally formed and has an exterior surface that has a density that is greater than a density of an interior surface.
- [c47] 47.The outboard motor of claim 46 wherein the exterior surface of the vibro-acoustic treatment is non-ab-

sorbent.

- [c48] 48.The outboard motor of claim 41 wherein the vibro-acoustic treatment has an average density of at least two pounds per cubic foot.
- [c49] 49.An outboard motor comprising:
an upper motor cover disposed about an engine;
a lower motor cover disposed about a midsection and forming a volume therebetween; and
a molded lower silencer having a shape that substantially matches a shape of the volume, the molded lower silencer being disposed in the volume.
- [c50] 50.The outboard motor of claim 49 further comprising another lower motor cover disposed about the midsection and enclosing a volume therebetween.
- [c51] 51.The outboard motor of claim 50 further comprising another molded lower silencer having a shape that substantially matches a shape of the volume between the another lower cover and the midsection.
- [c52] 52.The outboard motor of claim 49 wherein the molded lower silencer has a density of approximately twenty-two pounds per cubic foot.
- [c53] 53.The outboard motor of claim 49 further comprising a

molded upper silencer having a shape that substantially matches a shape of a volume between the upper motor cover and the engine.

[c54] 54. The outboard motor of claim 53 wherein the molded upper silencer has a density of at least four pounds per cubic foot.